

WHAT IS CLAIMED:

1. A method for avoiding collisions between a plurality of stations located in two or more basic service sets (BSSs) and operating in the same channel, the method comprising the steps of:

the mobile station receiving a frame, the frame including information indicative of which of basic service units (BSSs) are transmitting the frame to the mobile station;

the mobile station updating a first counter when the received frame is determined to be from the same BSS;

the mobile station updating a second counter when the received frame is determined to be from an overlapping BSS; and,

the mobile station transmitting within its corresponding BSS when the first counter and the second counter are zeros.

2. The method of claim 1, wherein the first counter is updated according to a duration specified in the received frame to ensure that the mobile station will not interfere with the transmissions in its own BSS.

3. The method of claim 2, wherein the received frame is determined to be from the overlapping BSS if the duration specified in the received frame is greater than a previous duration of the first counter upon reception of a QoS (+)CF-Poll frame.

4. The method of claim 1, wherein the second counter is updated according to a duration specified in the received frame to ensure that the station will not interfere with the transmissions in the OBSS.

5 5. The method of claim 1, further comprising the step of transmitting an acknowledgement by the mobile station in response to the received frame irrespective of the value of the counters.

10 6. The method of claim 1, wherein, if the received frame is a request-to-send (RTS) frame during a contention period, transmitting a clear-to-send (CTS) frame by the mobile station within its corresponding BSS when the first counter and the second counter are zeros.

15 7. The method of claim 1, wherein, if the received frame is a request-to-send (RTS) frame during a contention-free period, transmitting a clear-to-send (CTS) frame by the mobile station within its corresponding BSS when the second counter is zero.

20 8. The method of claim 1, wherein, if the received frame is a request-to-send (RTS) frame during a contention-free burst, transmitting a clear-to-send (CTS) frame by the mobile station within its corresponding BSS when the second counter is zero.

9. A method of operating a wireless local area network (WLAN) of the type having at least one basic service set (BSS) comprised of at least one access point (AP) and a plurality of mobile stations (STAs), the method comprising the steps of:

(a) transmitting a polling frame by the at least one of the access points to the mobile station, the polling frame including information indicative of the destination address of the frame and which of basic service units are transmitting the polling frame to the mobile station;

(b) storing the information indicative of which basic service sets are transmitting the frame to the mobile station and storing the destination address of the polling frame as a transmitting source;

(c) updating a first counter of the mobile station according to the duration field specified in the polled frame;

(d) receiving a frame by the mobile station, the frame including information indicative of the duration of the first counter;

(e) if the duration of the received frame is longer than the duration of the updated first counter, updating a second counter of the mobile station according to the duration indicated in the received frame; and,

(f) transmitting by the mobile station within its corresponding BSS if the first counter and the second counter are zeros.

10. The method of claim 9, wherein, if the duration of the received frame is not longer than the duration of the updated first counter, determining that the received frame is from an overlapping basic service set.

5 11. The method of claim 9, further comprising the steps of:
determining whether a source address of the received frame is equal to the transmitting source obtained in step (b) if the duration of the received frame is not longer than the duration of the updated first counter; and,

10 if not, updating the second counter of the mobile station according to the duration indicated in the received frame.

12. The method of claim 11, further comprising the step of transmitting by the mobile station within its corresponding BSS if the first counter and the second counter are zeros.

15 13. The method of claim 11, further comprising the steps of:
determining whether a destination address of the received frame is equal to the transmitting source obtained in step (b) if the duration of the received frame is not longer than the duration of the updated first counter; and,

20 if not, updating the second counter of the mobile station according to the duration indicated in the received frame.

14. The method of claim 13, further comprising the step of transmitting within its corresponding BSS by the mobile station if the first counter and the second counter are zeros.

5 15. The method of claim 9, wherein the first counter is updated according to a duration specified in the received frame to ensure that the station will not interfere with the transmissions in the BSS.

10 16. The method of claim 9, wherein the second counter is updated according to a duration specified in the received frame to ensure that the mobile station will not interfere with the transmissions in the OBSS.

15 17. The method of claim 9, further comprising the step of transmitting an acknowledgement by the mobile station within its BSS irrespective of the value of the counters.

20 18. The method of claim 9, wherein, if the received frame is a request-to-send (RTS) frame during a contention period, transmitting a clear-to-send (CTS) frame by the mobile station within its corresponding BSS when the first counter and the second counter are zeros.

19. The method of claim 9, wherein, if the received frame is a request-to-send (RTS) frame during a contention-free period, transmitting a clear-to-send (CTS) frame by the mobile station within its corresponding BSS when the second counter is zero.

20. The method of claim 9, wherein, if the received frame is a request-to-send (RTS) frame during a contention-free burst, transmitting a clear-to-send (CTS) frame by the mobile station within its corresponding BSS when the second counter is zero.

21. The method of claim 9, wherein, if the received frame is a QoS (+)CF poll frame from the AP, transmitting data by the mobile station within its corresponding BSS when the second counter is zero.

22. A local area network comprising:

a plurality of mobile stations, each mobile station having a first counter and a second counter;

at least one access point in communication with the plurality of mobile stations; and,

means for updating the first counter and the second counter when any mobile station units receive a frame to ensure that the mobile station will not interfere with the transmissions in its own BSS or in the overlapping basic service set (OBSS), wherein the mobile station is allowed to transmit within its corresponding basic service set (BSS) if the first counter and the second counter are zeros.

23. The network of claim 22, wherein the plurality of mobile stations further comprising means for transmitting an acknowledgement in response to the received frame irrespective of the value of the counters.

5 24. The network of claim 22, wherein the first counter is updated when the received frame is determined to be from the same BSS.

10 25. The network of claim 22, wherein the second counter is updated when the received frame is determined to be from the OBSS.

15 26. The network of claim 22, wherein the plurality of mobile stations further comprise means for utilizing request-to-send-(RTS)/clear-to-send(CTS) exchange to avoid potential interference with the transmissions in the BSS following the RTS/CTS exchange.

27. A machine-readable medium having stored thereon data representing sequences of instructions for avoiding collisions from stations (STAs) comprising two or more basic service sets (BSSs) collocated and operating in the same channel, and the sequences of instructions which, when executed by a processor, cause the processor to:

5 receive a frame, the frame including information indicative of which of basic service units are transmitting the frame to the mobile station;

update a first counter when the received frame is determined to be from the same BSS;

10 update a second counter when the received frame is determined to be from an overlapping BSS; and,

transmit by the mobile station within its corresponding BSS when the first counter and the second counter are zeros.

28. The machine-readable medium of claim 27, wherein the first counter is
15 updated according to a duration specified in the received frame to ensure that the mobile station will not interfere with the transmissions in its own BSS.

29. The machine-readable medium of claim 27, wherein the second counter is
20 updated according to a duration specified in the received frame to ensure that the station will not interfere with the transmissions in the OBSS.

30. The method of claim 27, wherein the process is further operative to transmit an acknowledgement by the mobile station in response to the received frame irrespective of the value of the counters.

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